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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,297	10/10/2003	Naoya Nakanishi	032004	7338

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EXAMINER

BELL, BRUCE F

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/682,297	Applicant(s) NAKANISHI ET AL.	
	Examiner Bruce F. Bell	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 8-11 is/are rejected.
- 7) ☒ Claim(s) 4-7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) ☐ Notice of Informal Patent Application (PTO-152) |
| 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/10/03; 4/28/04; 3/31/05; 10/31/05; 3/9/06</u> | 6) ☐ Other: ____ |

DETAILED ACTION

Claim Objections

1. Claims 1, 4, 8 are objected to because of the following informalities: The claims contain parenthesized subject matter which is essential to the invention which should not have parenthesis around the subject matter. Applicant is requested to remove the parenthesis, so that that subject matter in question has to be a part of the instant invention. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al (JP 2002-110253 or EP 1193782 A2 or US Pub 2002/0061443 A1) in combination with Fukuda et al (US Pub 2002/0197534).

Nakanishi et al disclose a positive electrode material that is a mixture of a lithium, nickel, cobalt and manganese composite oxide of the formula $\text{LiNi}_{(1-x-y)}\text{Co}_x\text{Mn}_y\text{O}_2$, wherein $0.5 < x+y < 1.0$ and $0.1 < y < 0.6$ and a lithium and manganese composite oxide of the formula $\text{Li}_{(1+z)}\text{Mn}_2\text{O}_4$, wherein $0 \leq z \leq 0.2$. See abstract. Nakanishi et al further disclose the use of a polyvinylidene fluoride binder in an amount of 5 parts by weight of the total weight of the positive electrode active substance. See para [0026]. The cell is

Art Unit: 1746

rolled or wound with a separator being disposed between the positive and negative electrodes and with the separator being polypropylene. See para [0030 and 0034].

Nakanishi et al does not disclose a negative electrode of graphite coated with a low crystalline carbon where whole or a part of a surface of the first graphite material as a substrate is coated with a second carbon material which is lower in crystallinity compared with the first graphite material.

Fukuda et al discloses an anode material for a lithium secondary battery which comprises graphite particles and a crystalline carbon coating layer formed thereon, wherein each graphite particle has a bent laminate structure inside and is produced by grinding a graphite of 5 mm or less in average particle diameter using an impact grinder to produce graphite particles of 100 micrometers or less in average particle diameter having a bent laminate structure inside each particle and then subjecting the graphite particles to chemical vapor deposition in a fluidized bed reaction furnace to form a crystalline carbon coating layer on the graphite particles. See abstract and para [0035 and 0037]. The anode material of the patented invention has a large capacity, a high potential and an excellent charge-discharge cycle property and which causes no decomposition of electrolytic solution. See paragraph [0002]. The graphite based anode has had problems in that the graphite reacts with a solvent constituting an electrolytic solution, which reduces the coulomb efficiency of the battery and the graphite decomposes the solvent to give rise to generation of gas in prior art devices. This is a serious problem possessed by the graphite based anode of the prior art since the graphite decomposes propylene carbonate having an excellent solvent property at low

temperatures, making it difficult to use propylene carbonate for an electrolytic solution. See para [0008]. To solve this problem, it was proposed to cover the surfaces of graphite with low-crystallinity carbon or amorphous carbon, each causing no propylene carbonate decomposition. See para [0009]. The reason for the prevention of the decomposition of propylene carbonate is presumed to be that since the surfaces of graphite particles are covered with the plane of crystalline carbon, the infiltration of solvent into anode material and resultant contact of solvent with graphite particles are prevented. See para [0011].

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though the prior art of Nakanishi et al does not disclose the use of a negative anode made of graphite coated with a low crystalline carbon in a lithium secondary battery, one having ordinary skill in the art would have the ability and motivation as seen by way of the patent to Fukuda et al to use such an anode in the device of Nakanishi et al to prevent decomposition of propylene carbonate, as well as other electrolyte solvents as set forth in para [0151], used in an electrolyte in the battery cell. The use of a negative electrode as set forth in Fukuda et al enables the cell to have an anode material with a large capacity, a high potential and excellent charge discharge cycle properties, which is the same as applicants instant invention is attempting to accomplish. Therefore, one having ordinary skill in the art would be motivated to use the negative electrode material of Fukuda et al in the invention of Nakanishi et al to improve the overall performance of the battery cell, since the improved cathode material of Nakanishi et al with the improved

anode material of Fukuda et al will enable improved overall performance and since the motivation to combine is set forth in the prior art patents.

Allowable Subject Matter

4. Claims 4-7 are allowable over the prior art of record.
5. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach and/or suggest a separator to positive electrode thickness ratio in a range of between 0.15 to 0.9. The prior art devices show a relationship between the thickness ratios of the negative electrode and the positive electrode but do not show a relationship between the positive electrode and the separator with respect to thickness.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce F. Bell whose telephone number is 571-272-1296. The examiner can normally be reached on Monday-Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1746

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BFB
July 11, 2006


Bruce F. Bell
Primary Examiner
Art Unit 1746